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(71) Applicant *(for all designated States except US)*: B.L. MACCHINE AUTOMATICHE S.P.A. [IT/IT]; Via Ronchi Inferiore, 30/B, I–40061 Minerbio (IT).

(72) Inventor; and
(75) Inventor/Applicant *(for US only)*: VETTORATO, Natale [IT/IT]; Via Ronchi Inferiore, 30/B, I–40061 Minerbio (IT).

(74) Agent: TROMBETTI, Gioia; Via Portazza, 8, I–40139 Bologna (IT).

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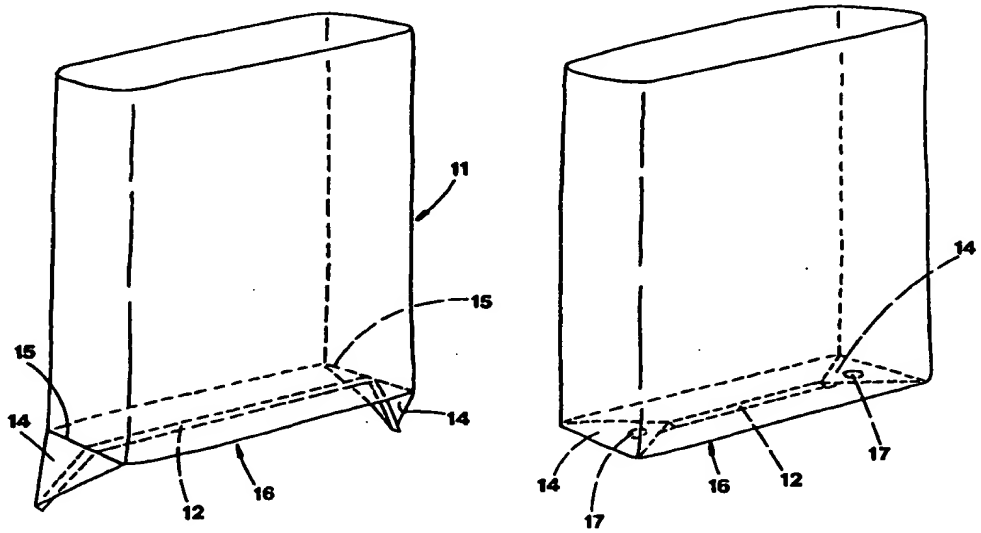

(57) Abstract

The method for making bags (20) out of plastic material comprises the cutting of individual portions (11) from a roll (10) of a tubular element and the simultaneous making of a bottom seam (12) crosswise to the tubular element itself. Each portion (11) is set up so as to form a bag with a filling opening (13) at the opposite end of the bottom seam (12). The extremities of the bottom of the bag are pressed down so as to form angular sections (14) which are sealed by means of seams (15) made crosswise to the bottom seam (12) and folded back against the external surface of the bag. The filling opening (13) is sealed by a crosswise top seam (22) after the bag has been filled with the relevant products (18). Angular sections (24) are then defined at the extremities opposite to the top of the bag. The angular sections (24) are sealed by means of seams (25) made crosswise to the top seam (22) and folded back against the external surface of the bag.

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A METHOD FOR FORMING BAGS IN PLASTIC MATERIAL AND THE BAG THUS PRODUCED

DESCRIPTION OF THE INVENTION

The present invention relates to a method for forming bags from plastic material.

It is known that various products such as granular products and the like are packed in plastic material bags which are hermetically sealed by means of heat sealing. These bags are employed for both product transportation and storage and generally bear on the outside the information for proper identification of their contents.

Presently, these bags are made starting from a tubular element of plastic material in a sheet, which is folded so as to form gussets along its opposite sides and flat wrapped in a roll. Individual portions, each bearing a crosswise seam which defines the bottom of the bag to be formed, are then cut from the roll.

As shown in Figure 1 for greater clarity, the bottom seam 2 extends to the overlapping sheets 3 and 4 of the tubular element 1 across the entire width of the same. Along the side edges, however, the seam also extends to flaps 3a and 4a folded inwards so as to form a gusset within sheets 3 and 4.

In such circumstances the sealing conditions between the central area of the tubular element 1 where only the two sheets 3 and 4 are to be sealed together,

and the side sections where four overlapping sheets are to be joined, that is sheets 3 and 4 as well as their relevant flaps 3a and 4a folded inwards to form the gussets, are markedly different. Seams made under these sealing conditions are far from ideal for both the central and the side sections of the gusseted tubular element.

This is rather a makeshift solution as the seam joining the central and side sections is made under differential sealing conditions, so that resistance at the critical point joining these two sections and indicated by C in Figure 1 is weaker.

So as to at least partially overcome this drawback, that is to improve resistance at the aforementioned critical point C, additional angular seams 5 are made, which are symmetrically arranged at the bottom and at the top of the bag.

These angular seams 5 are made in the section of the tubular element where the portion of the material defining the bag is subsequently cut and involve simultaneously the top of the preceding bag and the bottom of the subsequent one.

The angular seams 5 at the top of the bag cause a constriction of the opening 6 through which the bag is filled, as can be seen in Figure 2 where 7 indicates the gripping elements which widen the opening 6. This constriction causes a proportional reduction in the amount of product which may be introduced through the opening 6 at a time, i.e., in the filling rate, and therefore in overall productivity. To eliminate this drawback, an attempt has been made to

improve the filling rate by increasing the height from which the product was dropped into the bag, albeit this increased the risk of product spillage and so on.

The gusseted tubular element is then sealed by means of a second crosswise seam 8 which defines the top of the bag as shown in Figure 3 where 9 indicates the finished bag thus obtained. The same considerations made as to the reduced resistance at critical point C owing to the sealing of the gusseted folded flaps also applies to seam 8 at the top of the bag.

It should also be pointed out that the bags are easily subject to blows, falls and other similar events during handling and that such circumstances are extremely testing on the resistance of the aforementioned critical point.

Another drawback inherent in traditional gusseted bags is associated with the need to print identification data on to their outer surfaces. In order to do this, the surface which has to bear the printed data must be pre-treated accordingly so as to ensure that the ink to be applied will not come off. This treatment however hampers the perfect sealing of the plastic material so that it should preferably be avoided, or at least limited, in the folded side areas which are precisely those of the critical point where seam resistance is weaker.

In other words, there is the risk that any information printed in these areas will not be permanent so that there is no choice but to print the information on the front or back of the bags.

Such a limitation however detracts from the visibility of the printed information especially when the bags are stacked in piles or stored on shelves. In such circumstances, in fact, the information should ideally be printed on the sides so as to be easily and clearly visible and legible.

The object of the present invention is an easy and economic method for producing bags from plastic material which are highly resistant in particular in correspondence to the closing seams at the top and bottom.

A further object of the present invention is a method for producing bags from plastic material at high speed so as to ensure a high productivity rate.

An additional object of the present invention is a method for easily printing product identification data on the entire external surface of the bag.

With the above objects in view that will hereinafter appear, the nature of the invention will be more clearly understood by reference to the appended claimed subject matter, and the several views illustrated in the accompanying drawings.

In the drawings:

- Figure 1 is a perspective view of a portion of a traditional bag in plastic material.
- Figure 2 is a partial perspective view of said traditional bag during filling.
- Figure 3 is a perspective view of said traditional bag in its final configuration.

- Figures 4, 5, 6, 7, 8, 9, 10, 11 and 12 are schematic perspective views of the various steps of the method for forming bags in plastic material.
- Figure 13 is a perspective view of the bag thus formed.

With reference to the accompanying drawings, 10 is a tubular element of plastic material in a sheet wrapped in a roll (Figure 4), intended for forming the bags 20 as shown in Figure 13.

The method for forming said bags 20 comprises cutting individual portions 11 from said roll 10 and simultaneously making a crosswise seam 12 the purpose of which is to define the bottom of the bag. Seam 12 is made adjacent to the cutting or severance line on the roll 11 side, that is in correspondence to the bottom section of the subsequent portion to be cut (Figure 5). Seam 12 extends across the entire width of the tubular element.

The individual tubular portion 11 cut from roll 10 is subsequently formed so as to obtain the desired bag configuration, with filling opening 13 at the top (Figure 6).

The opposite extremities of the bottom of the bag are pressed down by means of appropriate gripping tools as shown by arrows A in Figure 7 so as to define the respective angular sections 14 across which seam 12 partially extends along the central line.

The angular sections 14 are next sealed along seam lines 15 laid crosswise with respect to the bottom seam 12 and then folded in correspondence to said

seams 15 towards the bottom of the bag (Figure 8). Seams 15 define the width of the bottom of the bag comprising an essentially rectangular surface 16.

Angular sections 14 are secured to the bottom 16 of the bag by means of spots 17 of a suitable glue (Figure 9).

The bag is subsequently filled with products 18, which are introduced through opening 13 as indicated by arrow B in Figure 10.

Opening 13 is then closed at least partially by means of a second crosswise seam 22 (Figure 11). Seam 22 extends crosswise to the head of the tubular element in such a way as to allow vents 19 at the opposite ends.

The bag is then completely closed by defining the angular sections 24 at the extremities of the top in a manner similar to that described for the bottom of the bag (Figure 12). The angular sections 24, sealed by means of seams 25 crosswise to seam 22, are then folded towards the top of the bag and secured by glue spots. Seams 25 close off vents 19.

The shape of top 26 defined by seams 25 is rectangular and essentially similar to that of bottom 16.

Bag 20 made according to the method described is formed from a non-gusseted tubular element of plastic material. It follows that at the top and bottom of the bag two facing sheets are sealed together along the entire width of the tubular element, as clearly shown in Figures 5 and 11, unlike in the traditional methods employing gusseted tubular material. This permits to form

the bag under optimal sealing conditions, thus avoiding discontinuities in the seam and, consequently, the formation of weak points.

The bag thus formed is therefore highly resistant, especially along the two seams 12 and 22. The angular sections 14 and 24 sealed along seam 15 and 25 and folded back over the external surface of the bag also contribute to improving the overall strength of the bag.

In the present embodiment of this invention angular sections 14 and 24 are folded back over the bottom 16 and top 26 of the bag, respectively. These angular sections 14 and 24 may however be folded back against the sides 21 of the bag.

In addition to the advantages so far described, non-gusseted tubular material also makes for a lower basic cost and for smaller rolls. In fact, the folded gusseted edges of gusseted tubular material entail a double thickness which, in turn, means that the diameter of the roll is much greater.

A further advantage of using non-gusseted tubular elements is the possibility of submitting the entire external surface of the material to pre-treatment for printing without any detriment to subsequent sealing. In fact, unlike with the traditional gusseted tubular material where the flaps of the gusseted external surfaces facing each other also come to be sealed, only the internal surfaces of the non-gusseted tubular element undergo sealing.

Identification data and any other possible information can therefore be printed on the entire surface of the bag, including the sides.

An important feature of the method herein described is the high productivity rate it permits thanks to the high filling rate. In fact, as the opening of the bag is not hampered by any constrictions, filling is easier and quicker.

Although in the present description the angular sections 14 and 24 are defined by sealing seams 15 and 25, it will be appreciated that said junction lines may alternatively be made by means of appropriate glues or other means.

It is obvious that the above description is intended to be purely illustrative and does not limit in any way the scope of the invention. Accordingly, any and all modifications and variations thereto should be considered to fall within the scope of the invention as described and claimed herein.

CLAIMS

What is claimed is:

1. A method for the production of bags from plastic material characterised by the fact that individual portions 11 are cut from a roll 10 of a tubular element of plastic material in a sheet and that a bottom seam 12 is simultaneously made crosswise to the tubular element and adjacent to the cutting line; that said portion 11 cut from the tubular element is then set up so as to form a bag featuring a filling opening 13 at the opposite end to that of the bottom seam 12; that the opposite extremities of the bottom of the bag are pressed down so as to define the respective angular sections 14 across which an end portion of the bottom seam 12 extends along the central line; that said angular sections 14 are sealed off by means of respective seams 15 made crosswise to the bottom seam 12; that said angular sections 14 are folded back against the external surface of the bag along seams 15; that the filling opening 13 is at least partially closed by means of a crosswise top seam 22 after the bag has been filled with relevant products 18; that angular sections 24 are defined in correspondence to the opposite extremities of the top of the bag; that said angular sections 24 are sealed off by means of seams 25 made crosswise to said top seam 22 and folded back against the external surface of the bag along seams 25.

2. A method as set forth in Claim 1, characterised by the fact that said angular sections 14 and 24 are secured to the external surface of the bag by means of spots 17 of an appropriate glue.

3. A method as set forth in Claim 1, characterised by the fact that angular sections 14 and 24 are folded back against bottom 16 and top 26 of the bag, respectively.

4. A method as set forth in Claim 1, characterised by the fact that said top seam 22 extends across the width of the tubular element in such a way as to form vents 19 at the respective extremities, said vents being subsequently sealed off by means of seams 25.

5. A method as set forth in Claim 1, characterised by the fact that the bottom seam 12 is made on the roll 11 side with respect to the cutting line in such a way as to define the bottom of the subsequent portion of material to be cut.

6. A method as set forth in Claim 1, characterised by the fact that seams 15 and 25 are made by means of sealing.

7. A method as set forth in Claim 1, characterised by the fact that seams 15 and 25 are made by the application of glue.

8. A bag of plastic material characterised by the fact that it is made from a portion 11 of a tubular element of plastic material in a sheet, sealed off at the bottom and at the top by crosswise seams 12 and 22 and featuring at the opposite extremities of said seams 12 and 22 angular sections 14 and

24, respectively, defined by seams 15 and 25, respectively, made crosswise to seams 12 and 22 and folded back against the external surface of the bag.

9. A bag as set forth in Claim 8, characterised by the fact that seams 15 and 25 are made by sealing.

10. A bag as set forth in Claim, characterised by the fact that seams 15 and 25 are made by the application of glue.

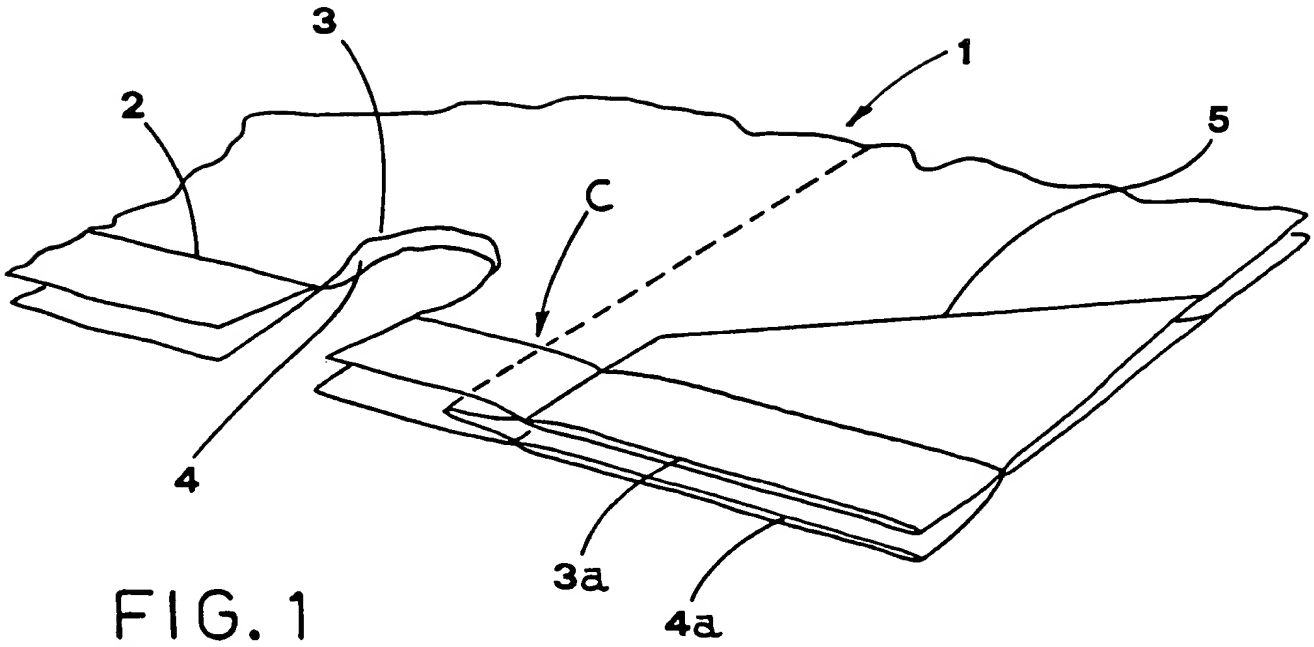

FIG. 1

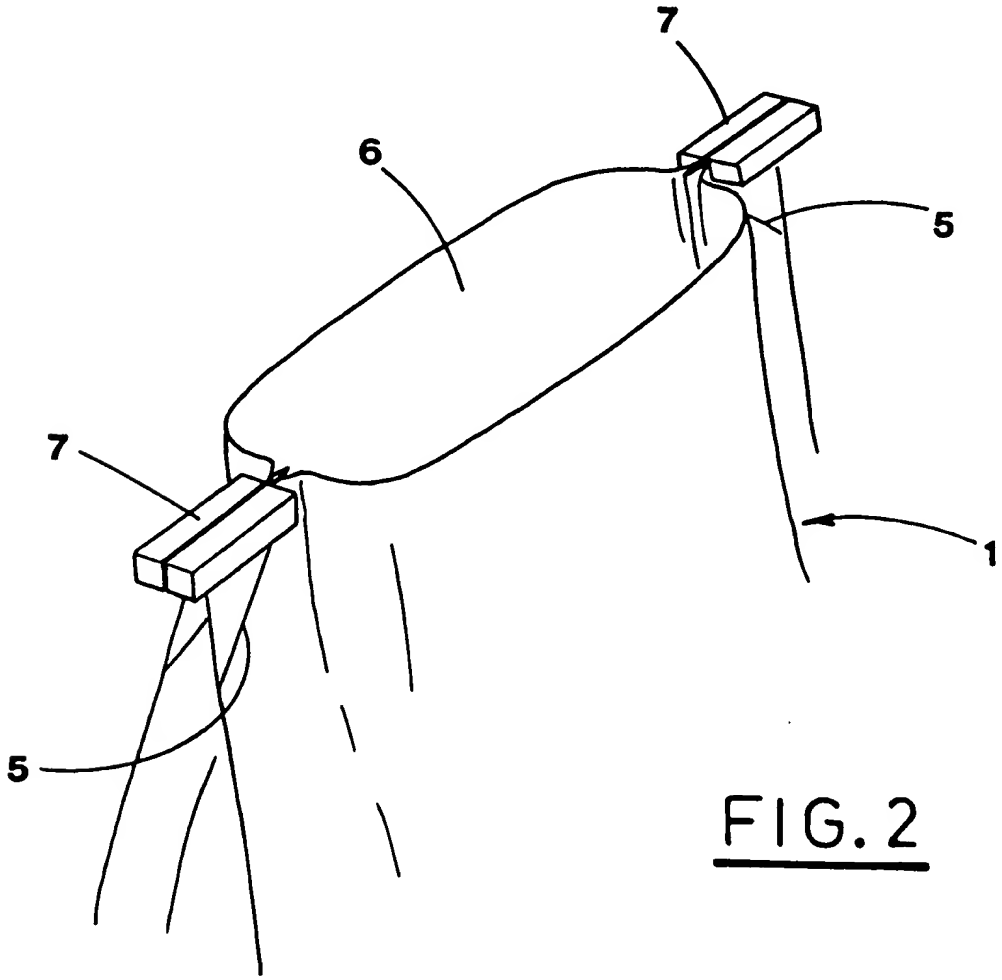

FIG. 2

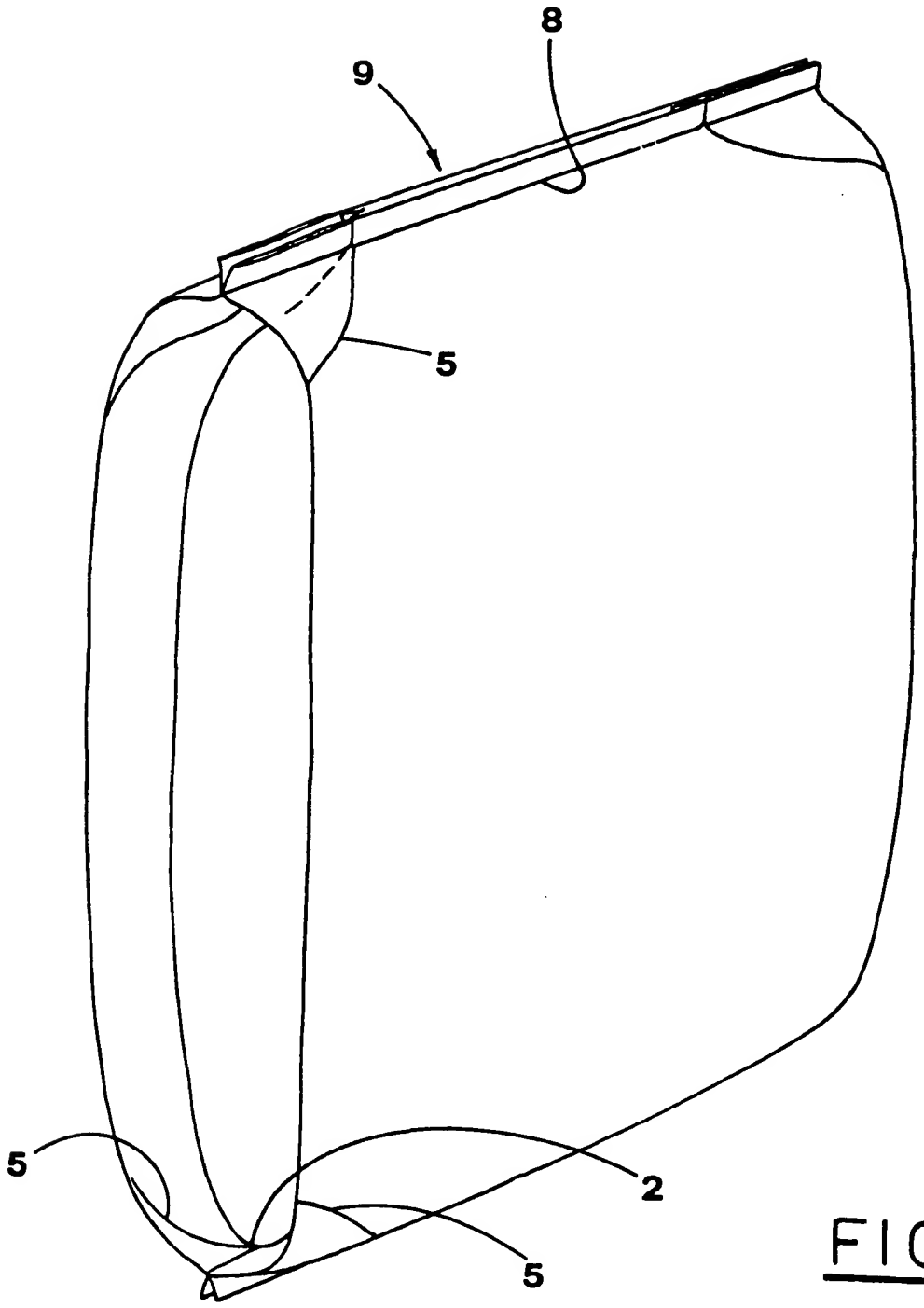

FIG.3

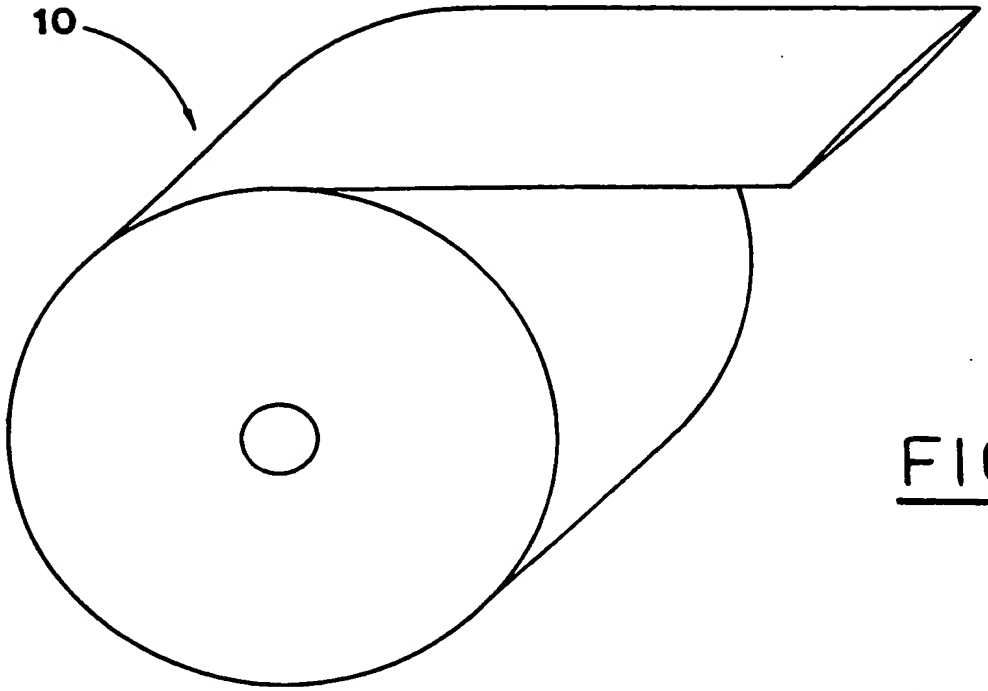

FIG. 4

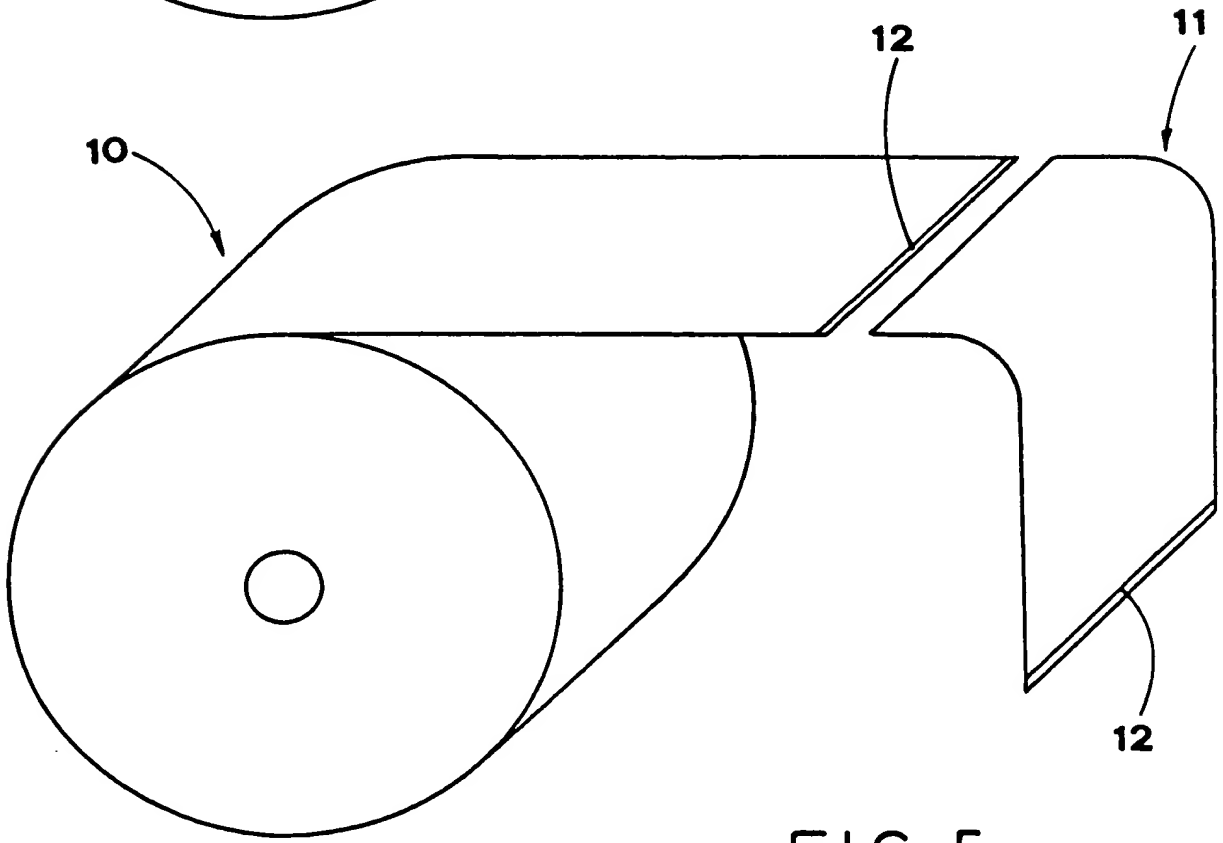

FIG. 5

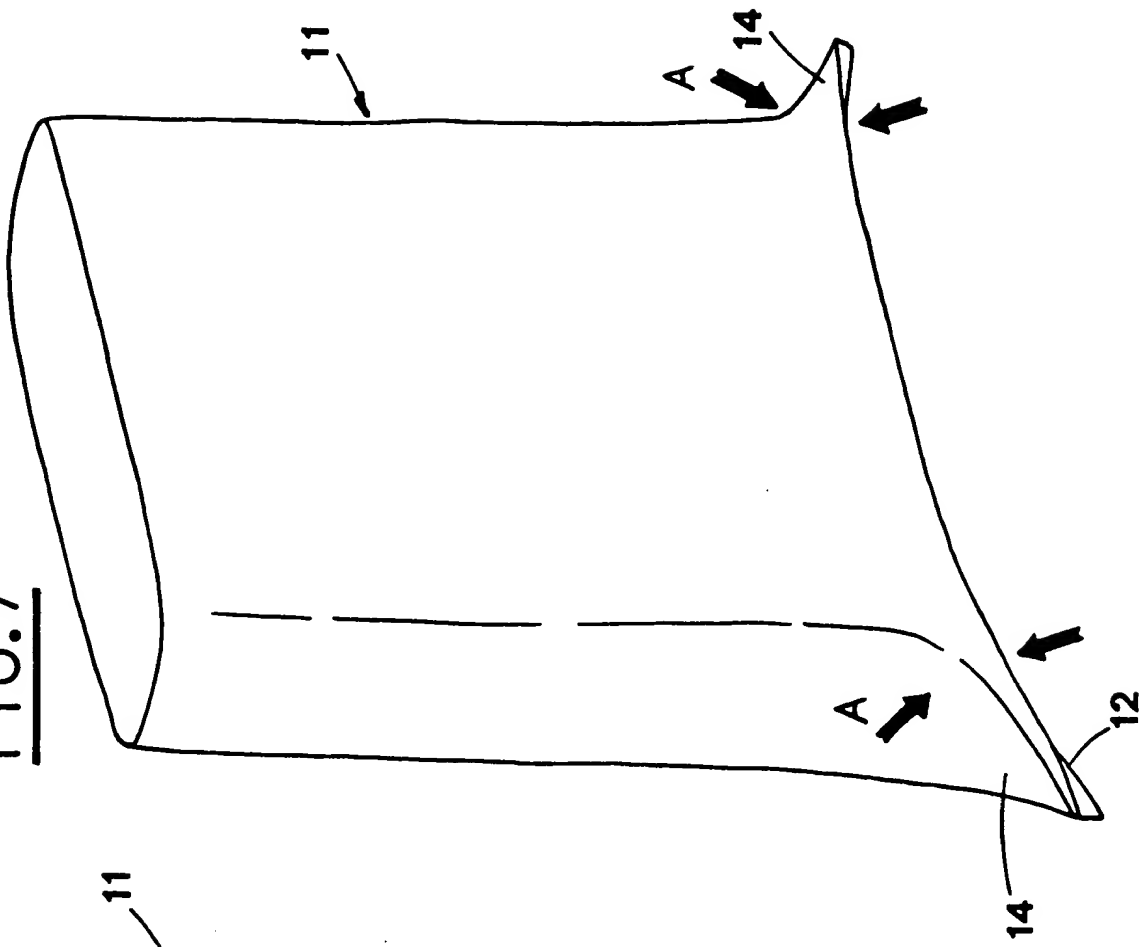

FIG.7

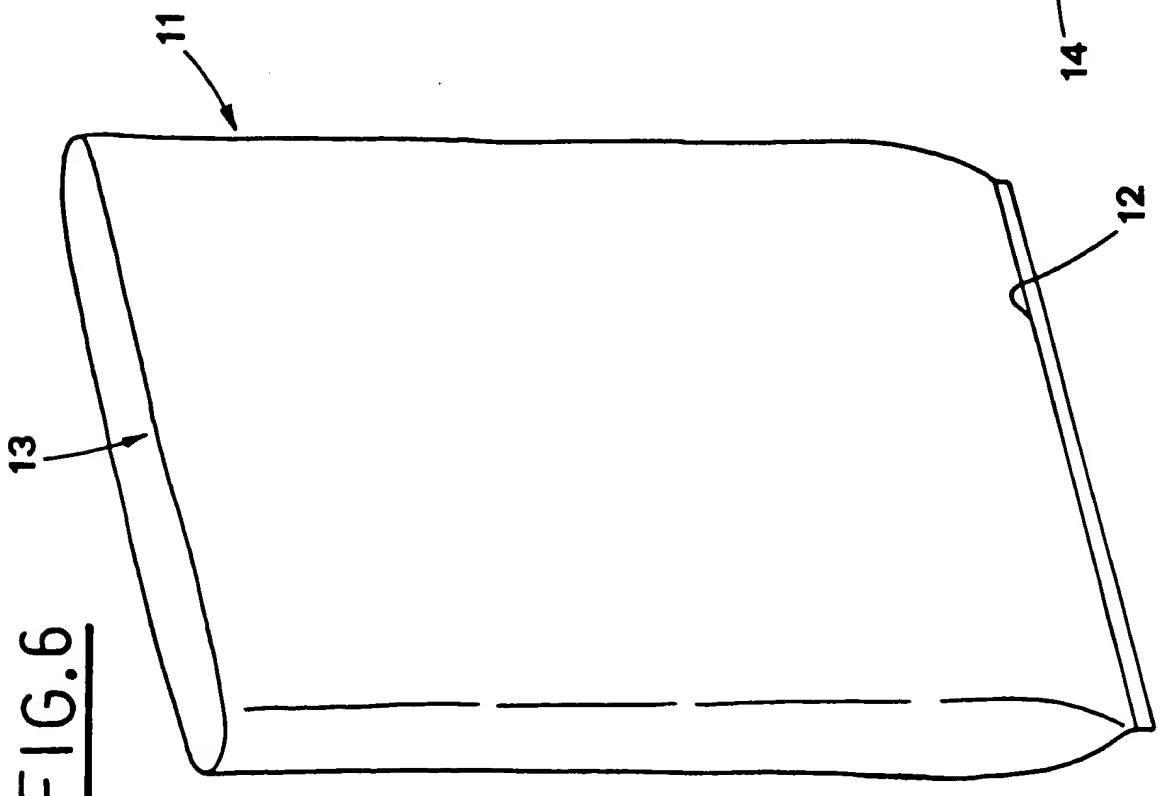

FIG.6

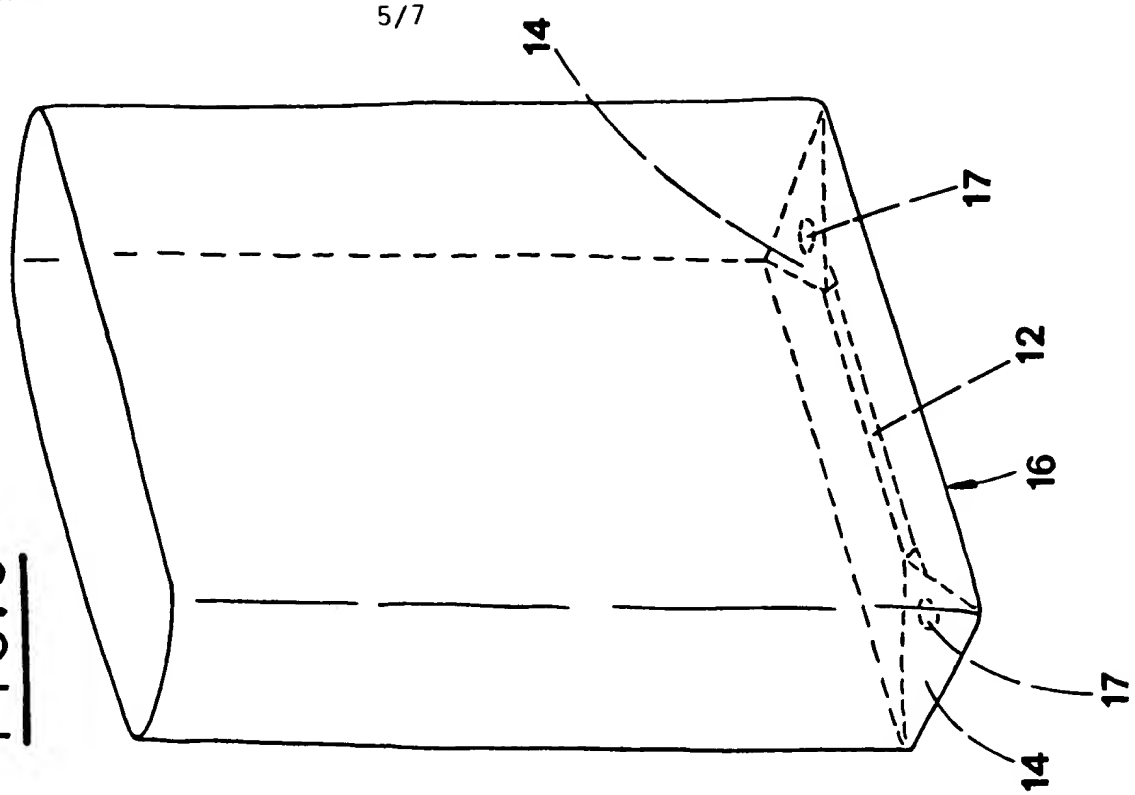

FIG.9

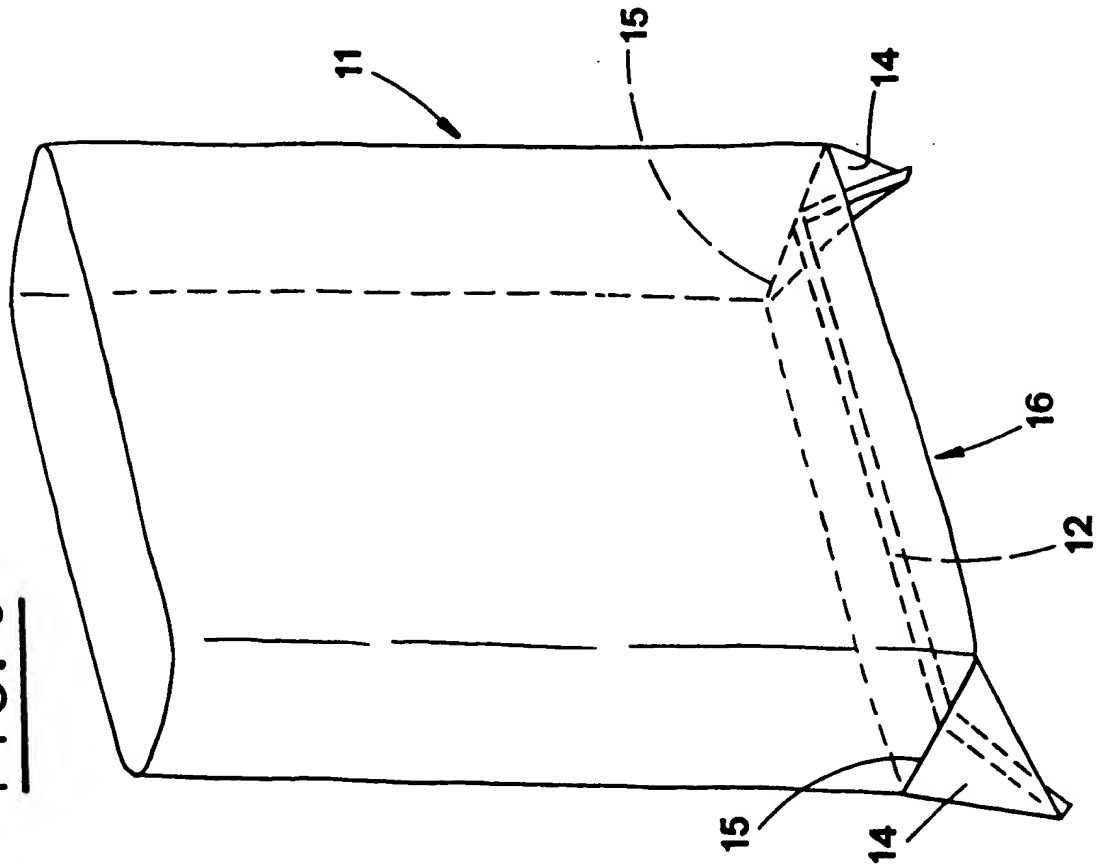

FIG.8

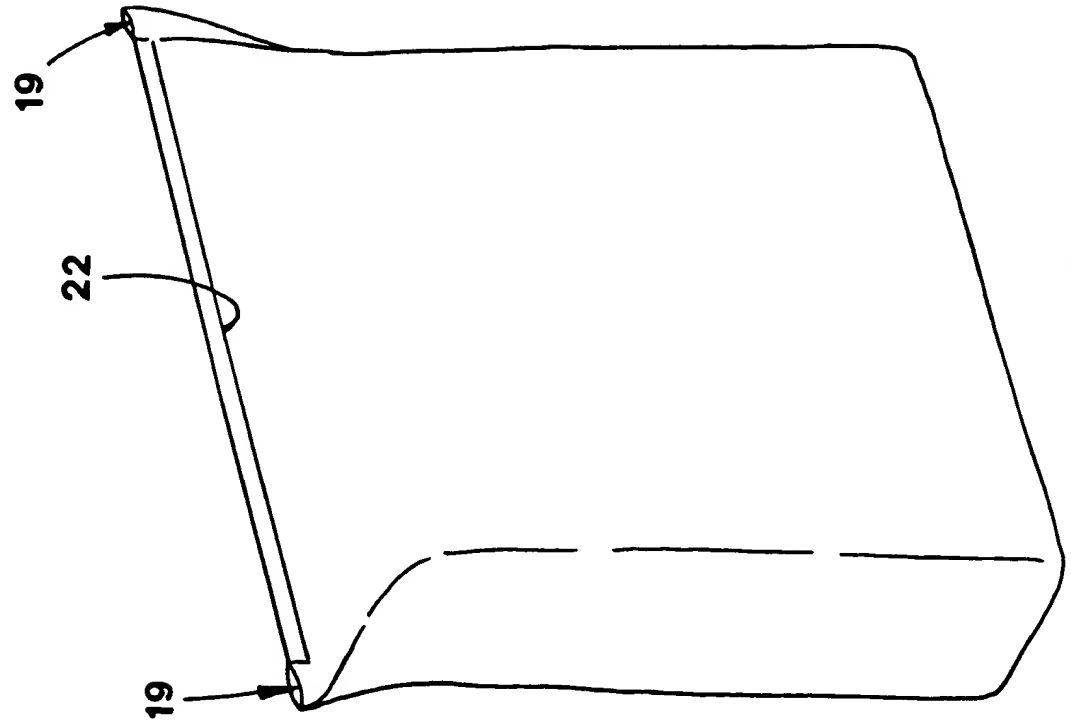

FIG. 11

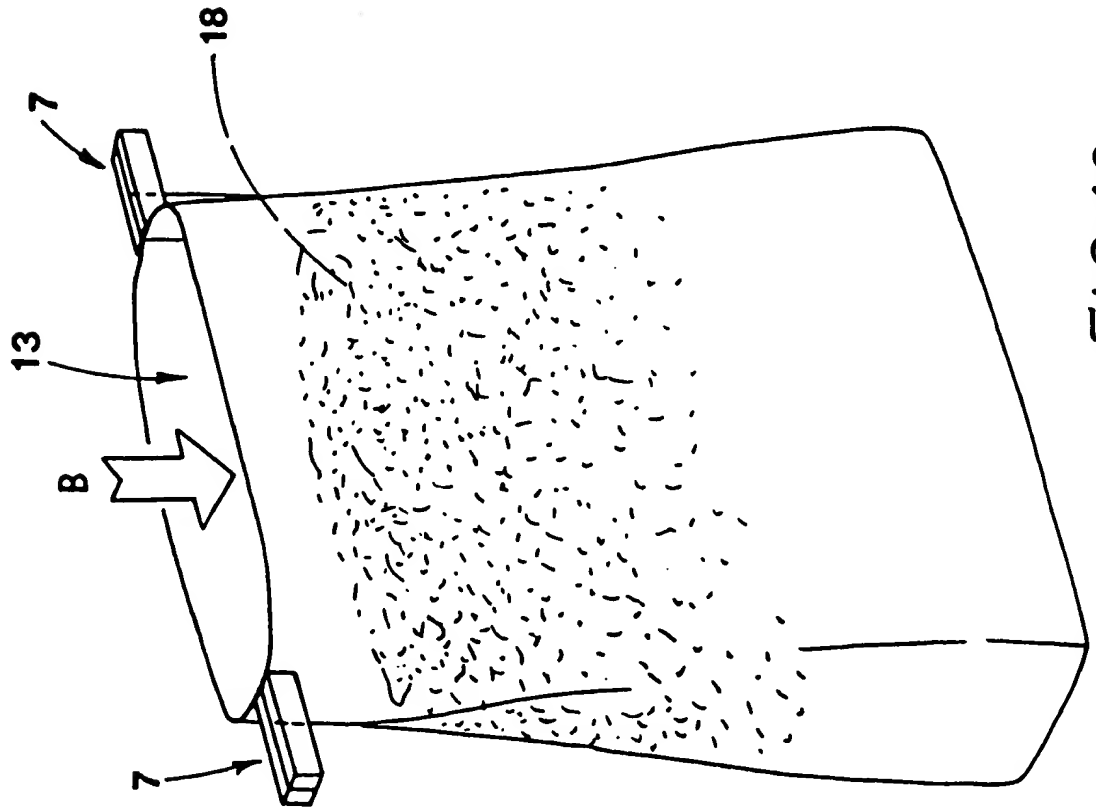

FIG. 10

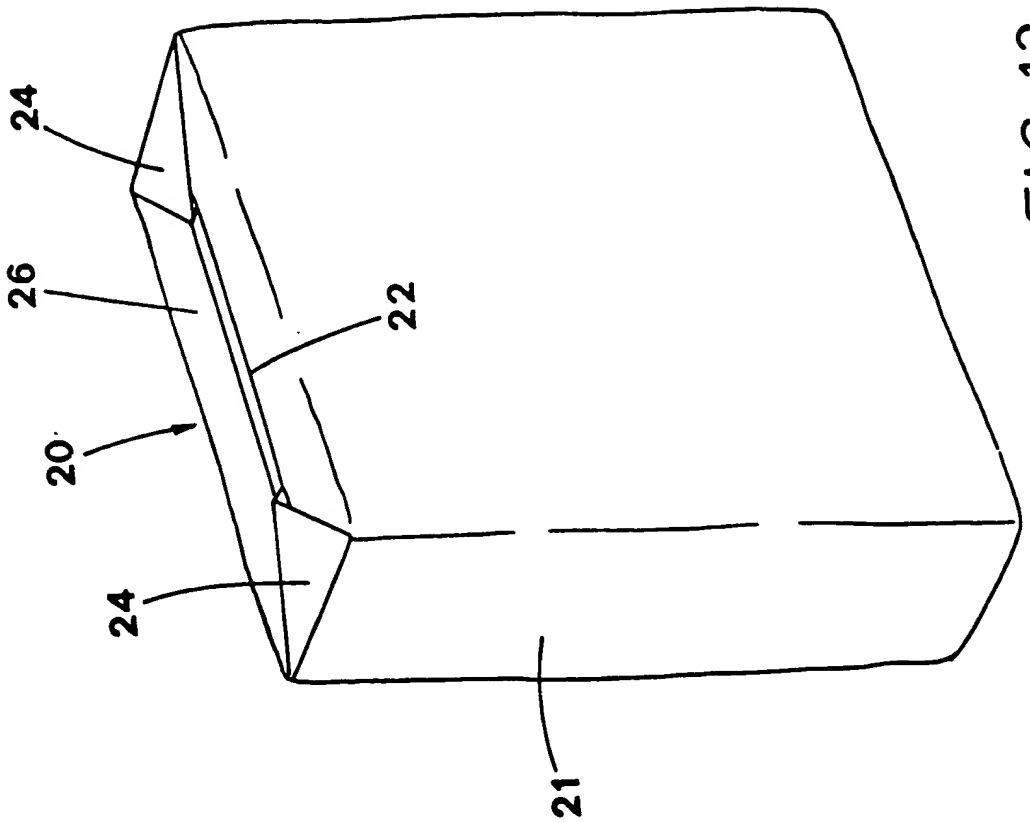

FIG.13

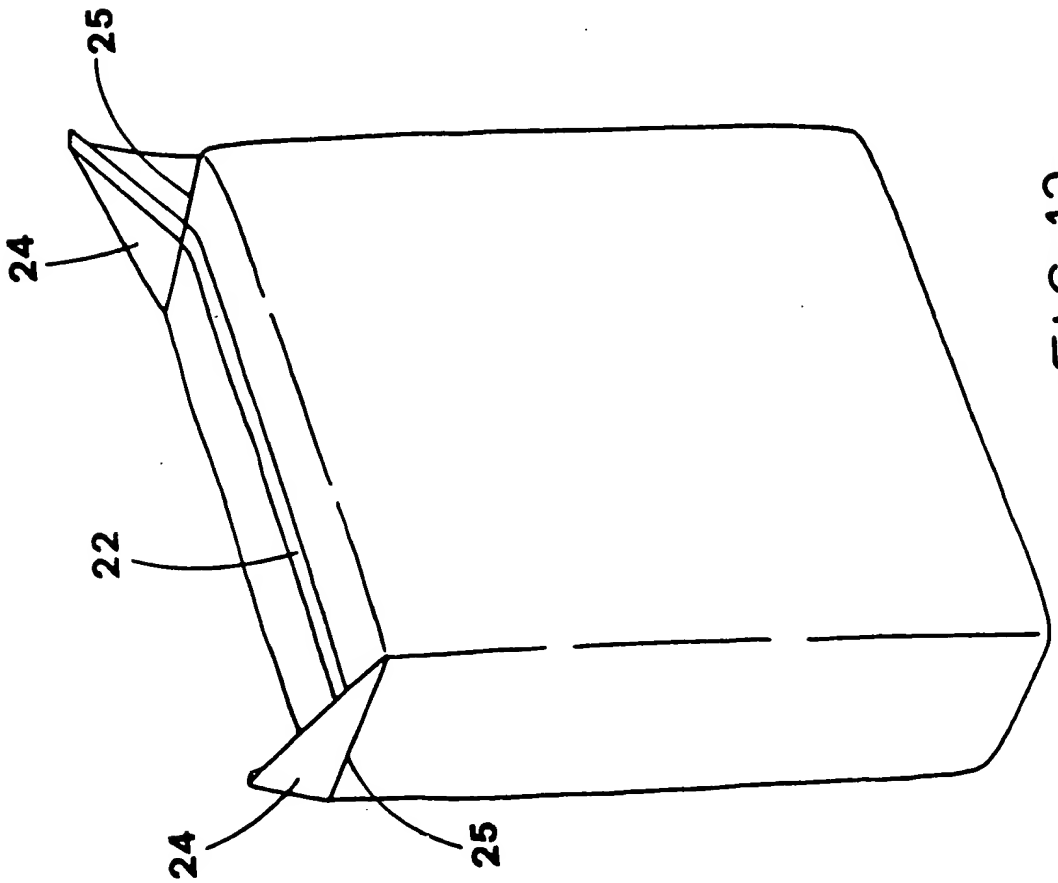

FIG.12

INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 B65B1/02 B65D75/00 B65D75/44

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 B65B B65D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	FR 2 643 340 A (PAULZE D'IVOY) 24 August 1990 see page 4, line 11 - page 7, line 31	1-3,5,6, 8,9 7,10
Y	GB 1 141 714 A (REICHE) 29 January 1969 see page 1, line 47 - line 84; figures 1-5	7,10
A	GB 930 811 A (JARDINE) 10 July 1963 see figures 1,3,6-13	1,8
A	GB 1 115 636 A (SCHNEIDER) 29 May 1968 see figures 10-20	1,8
A	FR 2 676 990 A (GARACCI) 4 December 1992 see figure 2	1

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[X] Further documents are listed in the continuation of box C.

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

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A	DE 14 61 938 A (JAGENBERG-WERKE) 13 March 1969 see figures 1,2	1,8

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
FR 2643340 A	24-08-90	EP 0460039 A	11-12-91
		WO 9009933 A	07-09-90
GB 1141714 A		NONE	
GB 930811 A		NONE	
GB 1115636 A		NONE	
FR 2676990 A	04-12-92	NONE	
DE 1461938 A	13-03-69	NONE	